maps

FIELD INVESTIGATION
of
ATLAS ASBESTOS
and
COALINGA ASBESTOS MINES

Date of Investigation: May 19 to 21, 1980

EPA Investigators: Kenneth Greenberg,
Environmental Engineer

Richard Vaille,
Environmental Engineer

Report Prepared By: Richard Vaille

Date Prepared: July 22, 1980

~~A000125~~

This is an in progress report of asbestos contamination of streams in the Atlas Mine and Coalinga Mine areas. It is based on a field inspection of the area conducted on May 19 to May 21, 1980. This report contains the results of laboratory analysis which were available as of July 22, 1980.

CONTENTS

OBJECTIVES

The objectives of this fields investigation were as follows:

A) To extensively sample the stream systems draining the Atlas Mining Area, the Coalinga Mining Area,.and the surrounding non-mining areas for the presence of asbestos. Sampling sites were chosen that would make possible a determination of the approximate amount of asbestos entering the stream systems from erosion of the mining and ore processing sites. Further sampling sites were chosen to determine the background concentration of asbestos in the streams of this general area. Finally samples were taken to determine if the asbestos concentration (if any) in Los Gatos Creek was effected by the influent water from its tributaries draining the mining areas.

B) To conduct a general reconnaissance of the area. Close attention was given to current drainage patterns near the mining areas as well as signs of erosion. Further attention was given to local geology, geomorphology and vegetation.

C) To determine what (if any) population utilizes the water of Los Gatos Creek for drinking purposes.

D) To determine if the mines' tailings piles in their present condition and placement constitute a potential hazard.

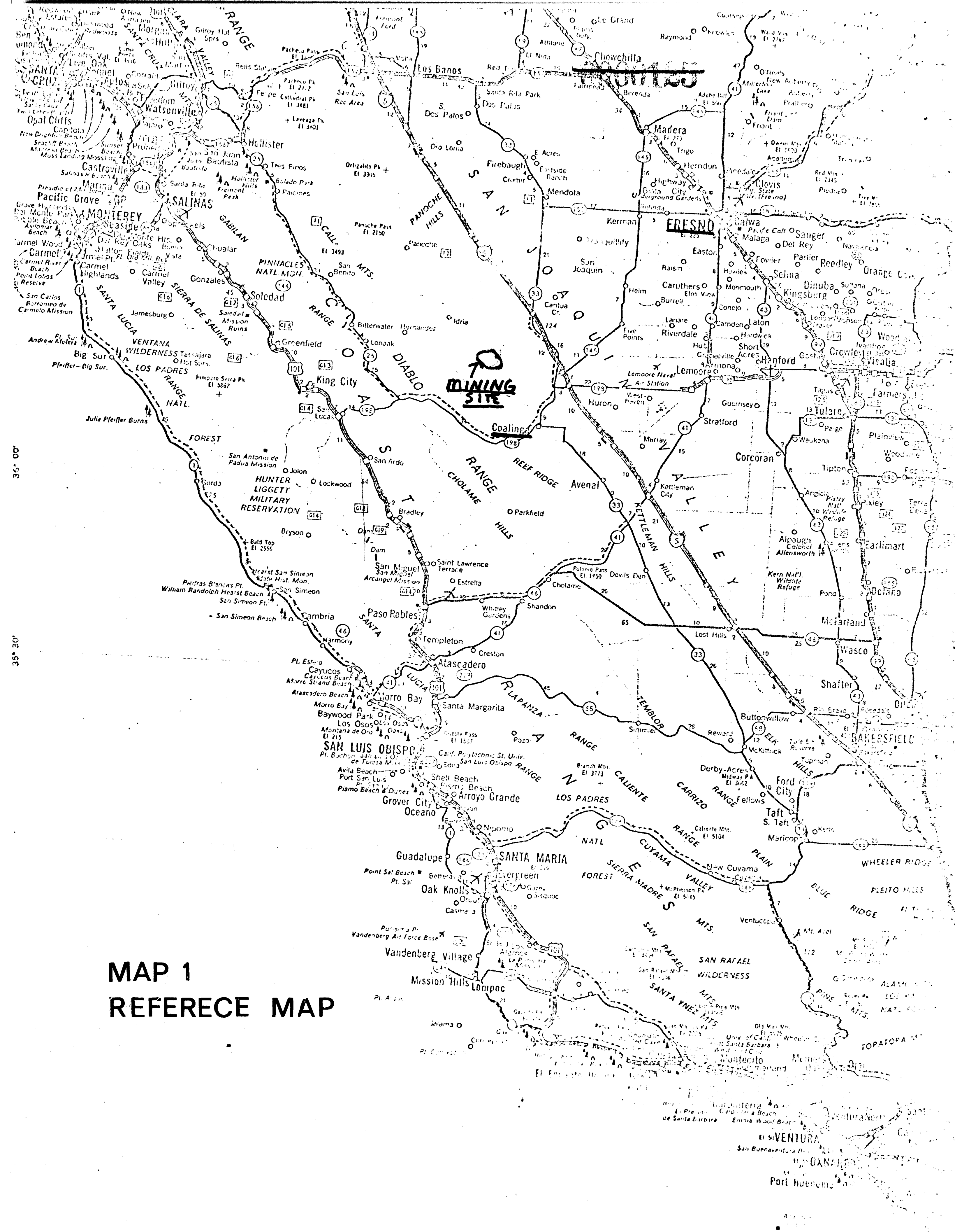
BACKGROUND

Geology

The predominate geologic feature of this region is an elongated asymmetric domelike mass of serpentine in fault contact with steep-dipping sedimentary beds (Eckeland Myers, 1946). Note Map 2. This mass of serpentine is no less than 2000 feet thick. A major component of this serpentine mass is chrysolile, a fiberous asbestos mineral. The greater part of the serpentine is strongly sheared and similiar in appearance to talc.

Precipitation

This area receives aproximately 50 to 75 cm. of precipitation per year according to the Atlas of California (1979). This is sharp contrast to the adjacent Central Valley which receives less than

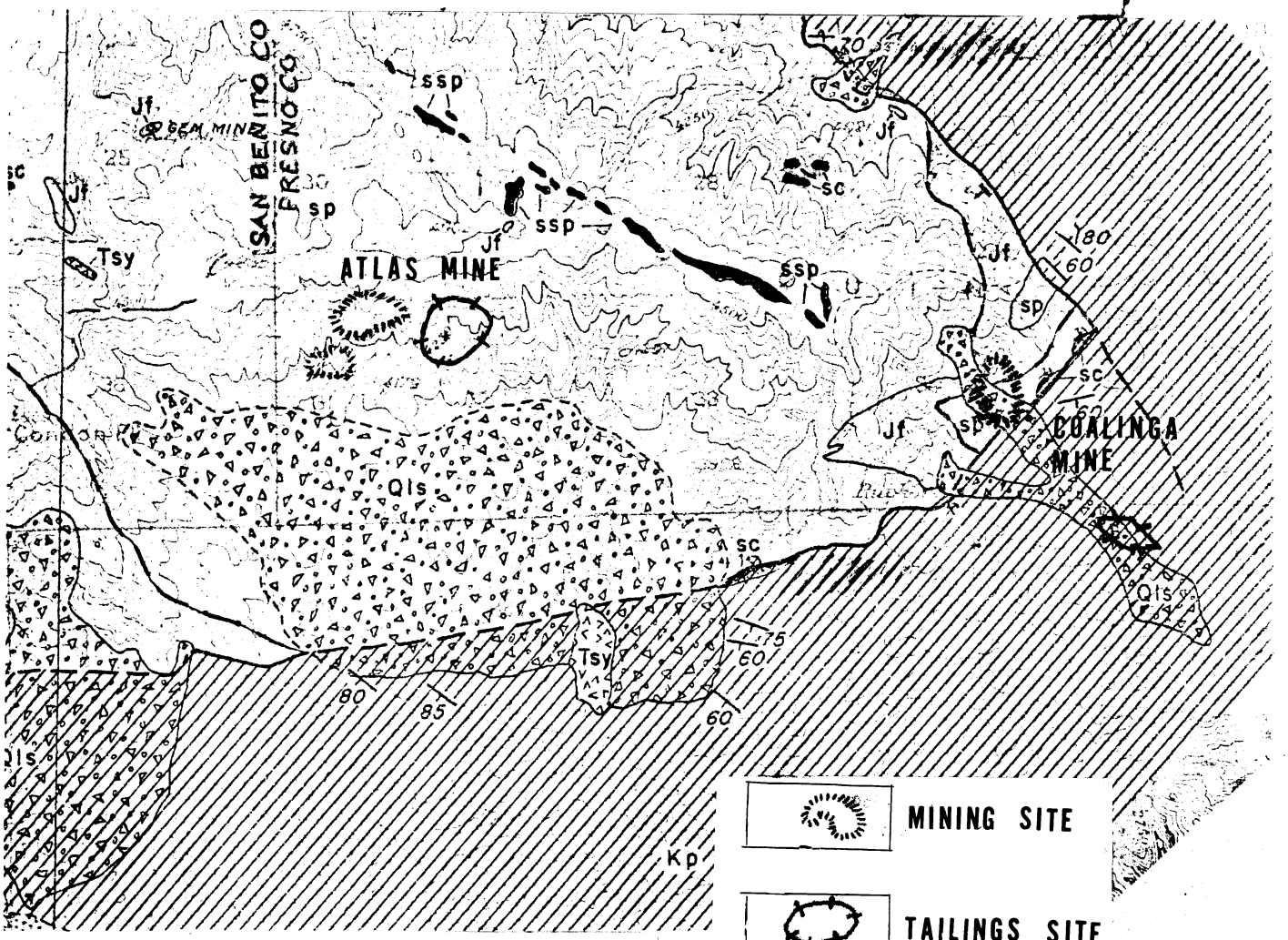


MAP 1
REFERECE MAP

MAP 2

GEOLOGIC MAP OF THE

ATLAS AND COALINGA MINING AREA



MINING SITE

TAILINGS SITE

Jurassic

sp — Serpentine. *(Altered ultrabasic, intrusive rock.)*

Jf — Franciscan group. *(Massive, arkosic sandstone; minor shale, chert and greenstone.)*

QUATERNARY

Furnace dumps.

Qls — Landslide. *(Shallow bodies. Patterns show underlying bedrock.)*

ROCK ALTERATIONS

sc — Silica–carbonate rock. *(Altered serpentine, often contain minor cinnabar deposits.)*

sm — Silica–carbonate rock. *(Altered serpentine, chief carbonate is magnesite.)*

ssp — Slightly silicified serpentine.

Indurated shale or sandstone. *(Contain principal cinnabar deposits of district.)*

TERTIARY

Eocene to Pliocene

Tsy — Soda syenite. *(Small intrusive stocks.)*

Ts — Sediments, undivided. *(Slightly consolided shale, sandstone and conglomerate.)*

Cretaceous

Km — Moreno formation. *(Organic shale with several lenses of sandstone.)*

Kp — Panoche formation. *(Gray shale and gray to brown, massive, concretionary sandstone.)*

0 1 2 3 4 5 Miles

10 cm. of precipitation a year. It is important to note precipitation is concentrated between October and May.

FIELD OBSERVATIONS

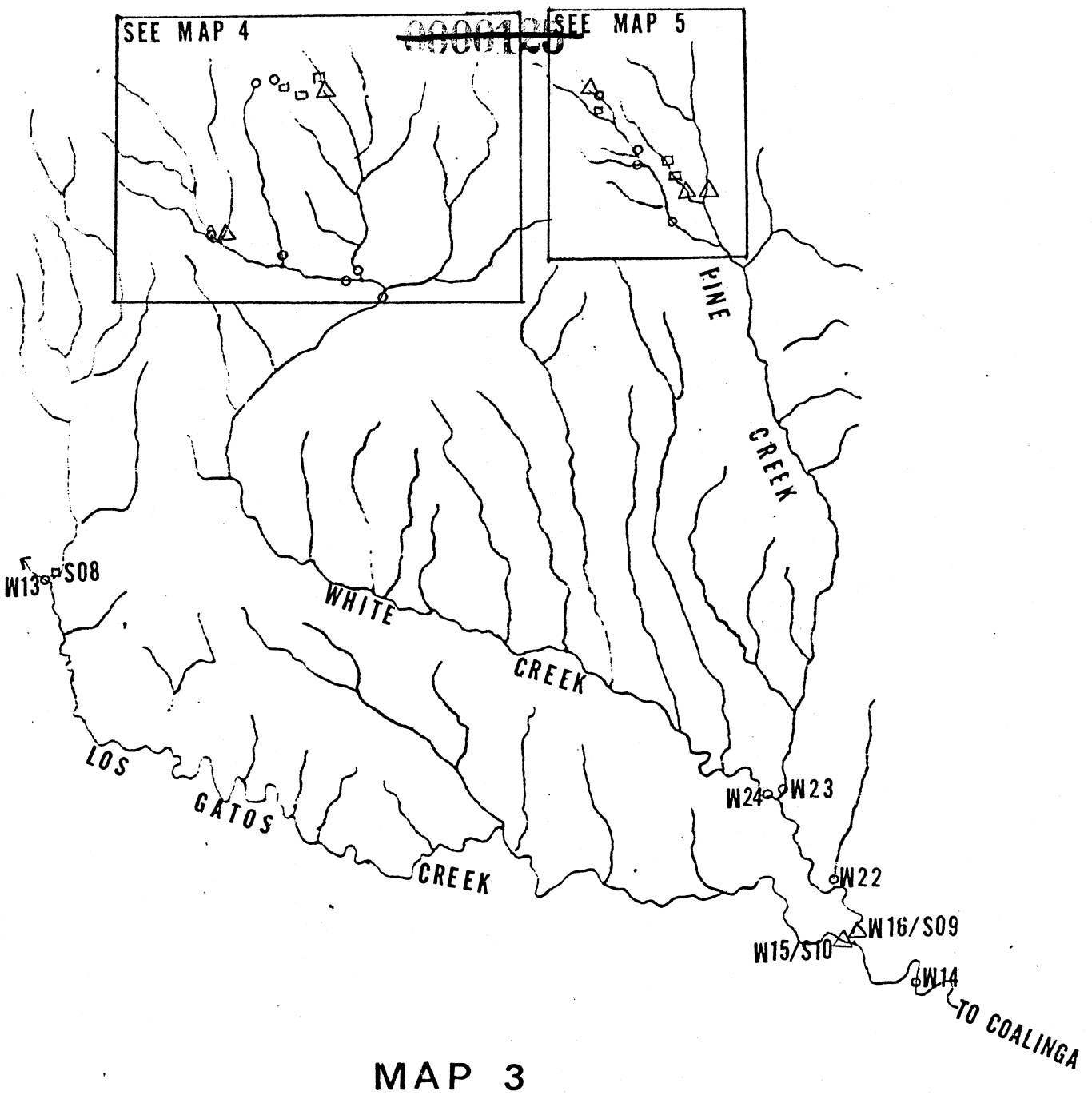
Regional Characteristics

This area is a mountainous region ranging in elevation from approximately 1000 to 4800 feet with mixed conifer and chaparral vegetative communities predominating. Evidence of widespread surface mining activity exists. At the present few mines are active but past prospecting and mining sites are common. Also characteristic of this area are barren outcroppings of weathered serpentine (see photos R1, R2, R3). A large number of these outcroppings are weathered to the extent they resemble older mining sites in texture and appearance.

Runoff in this area varies widely throughout the year as it does in much of the West Coast area. Between October and May most precipitation and resulting runoff occurs. Large amounts of eroded material are carried off by rain-swollen streams. The mining areas and the tailings piles are at higher elevations relative to the surrounding land. Therefore erosion of these areas is concentrated during periods of heavy runoff. During the dry summer months runoff decreases until many streams are dry. Maps 6 & 7 indicate the estimated volumetric flows of streams observed during this investigation. In most cases stream flow could be measured in gallons per second. Clearly erosion such as pictured in photo A 11 or A 29 cannot be attributed to the observed stream flows. The main erosion activity in this area occurs during times of heavy runoff. The stream flows during these periods are magnitudes greater than the observed flows of this investigation.

Atlas Mine

The Atlas Mine is located approximately 18 miles northeast of Coalinga, California in the upper reaches of the watershed of an unnamed tributary of White Creek. (See Maps 3 and 4.) The mill and tailings pile are at an elevation of roughly 4200 ft. The surface mining area is approximately 1/2 mile west of the mill and varies in elevation from 4200 ft. to 4400 ft. Photos A 1 through A 6 give a panoramic view of the mining area. Much of the site is devoid of vegetation and disturbed by mining activity. During periods of heavy precipitation and runoff, this area is subject to heavy erosion as is evident in photos A 28 and A 29. No erosion control structures in the mining area were observed. Runoff from the mining area reaches White Creek via an unnamed tributary system.

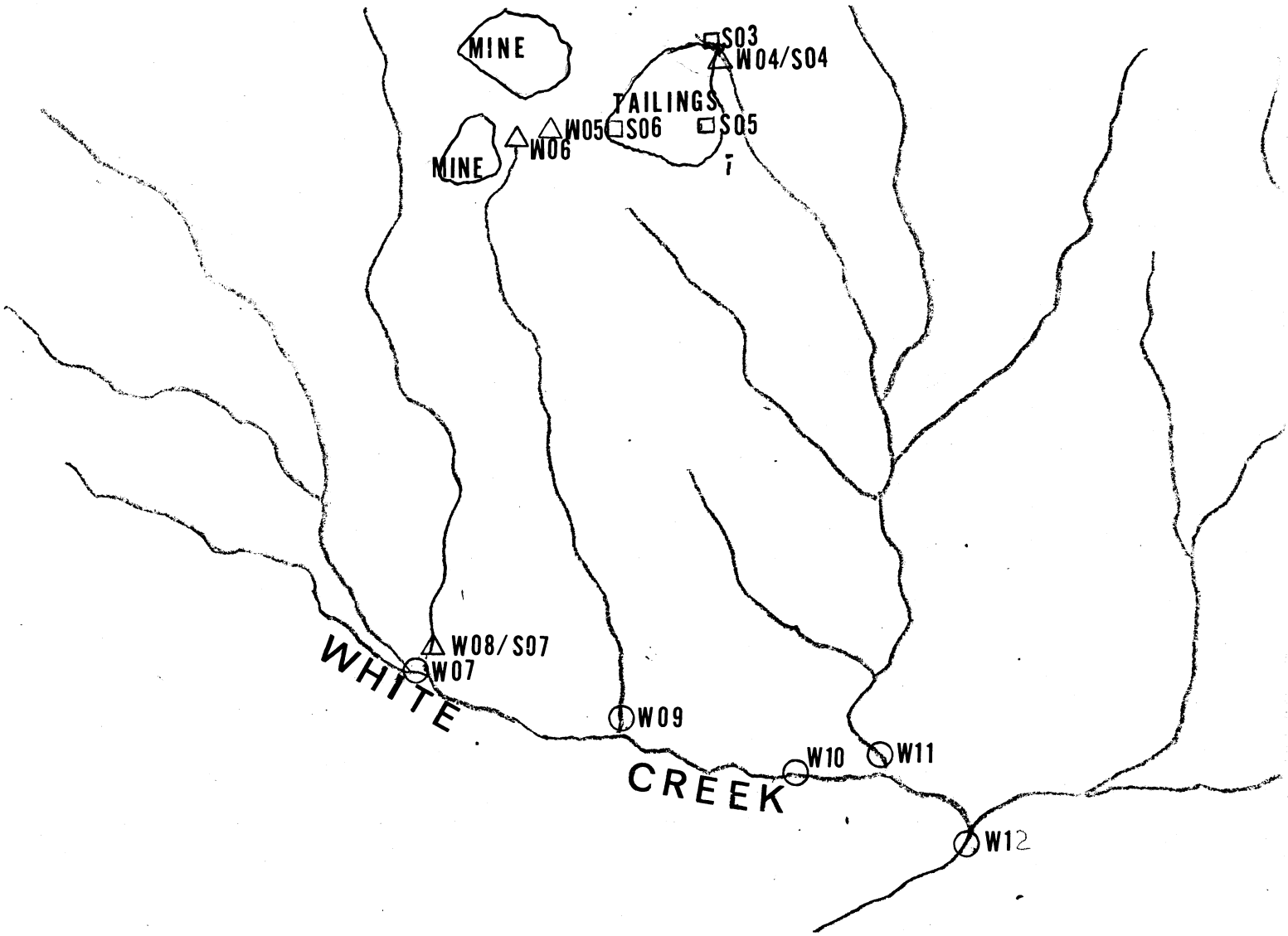


MAP 3

GENERAL REFERENCE MAP OF THE SAMPLING SITES

○ - WATER SAMPLING SITE
□ - SEDIMENT SAMPLING SITE
△ - WATER & SEDIMENT SAMPLING SITE

0 1 2
MILES



MAP 4

SAMPLING SITES ———ATLAS MINE AREA

○-WATER SAMPLING SITE
□-SEDIMENT SAMPLING SITE
△-WATER & SEDIMENT

Map 6 gives dimensions and major features of the tailings area. The tailings pile was estimated to be 20 acres in area. Analysis of field samples (See Sampling section) indicated the tailing pile was 10% (by weight) chrysoltile, a fiberous asbestos mineral. Photos A 7 through A 10 are a panoramic view of the plateau of the tailings pile. Note the fine, non-crusted surface texture of the tailings. Photos A 11 to A 15 show clear evidence of the extensive erosion of the tailings pile.

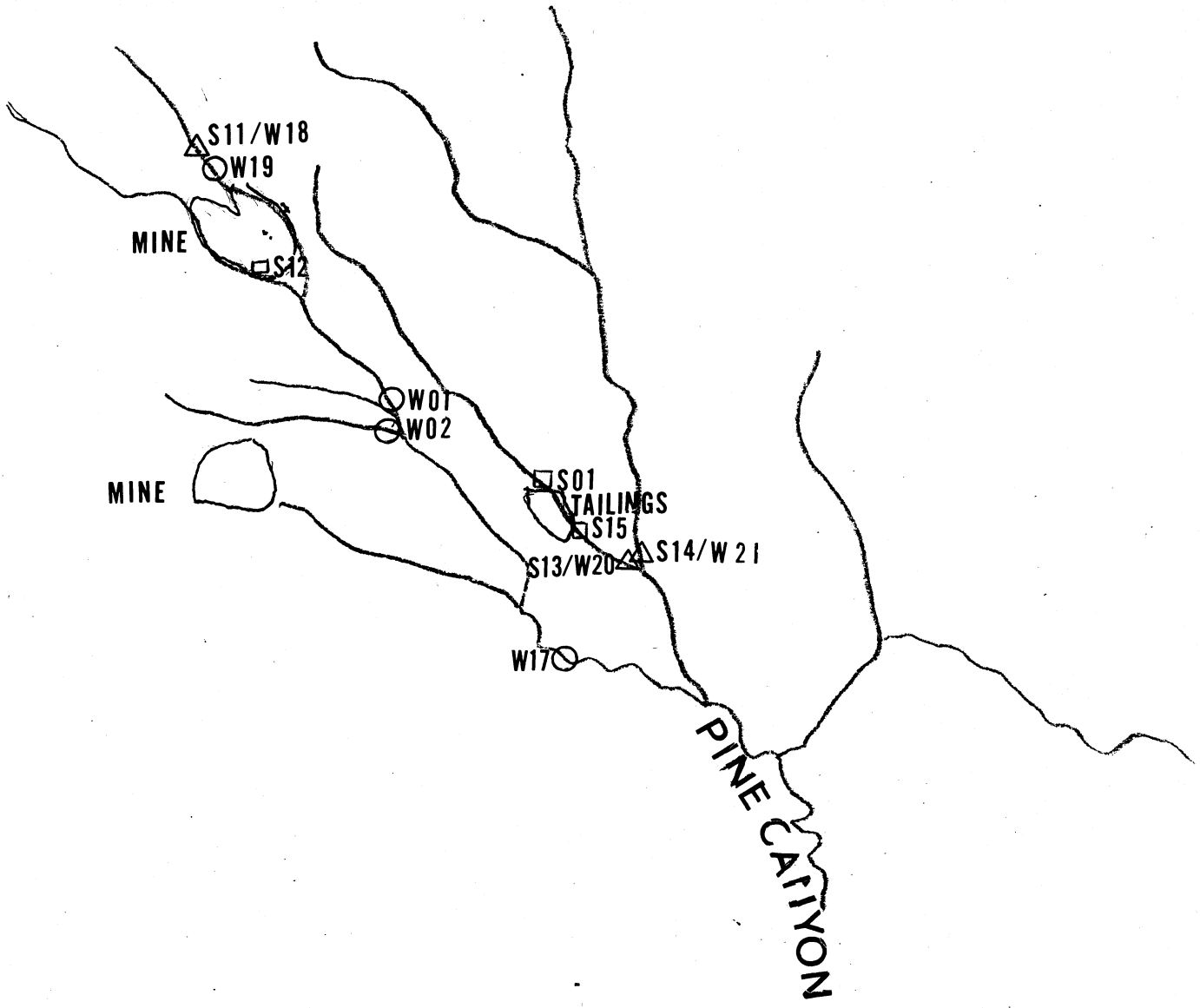
Map 6 also indicates the erosion control structures associated with the tailings pile. Dam A is approximately 15 feet thick, 20 feet high and 75 feet long. It is not apparent if its purpose is to impound water from above the tailings or to provide a road crossing across the canyon. This dam was constructed of crushed rock. "Dam" B is merely an extension of the tailings pile across a stream channel. (See photo A 16 and A 17.) This "dam" has been breached. It is not capable of impounding a significant amount of runoff. It does contribute a sizeable amount of eroded asbestos-bearing material to the stream.

Pond A impounds water from a limited watershed to the northeast of the tailings pile. Part of this water is utilized as process water by the mill. The pond is approximately 100 feet in diameter and had 5 feet of freeboard at the time of inspection. (See photos A 17 to A 20.)

Photos A 23 through A 27 give a panoramic view from the southern edge of the top of the tailings pile (looking south.) The main feature in this panorama is the lower "bench" adjacent to the tailing pile. This "bench" is approximately 75 feet lower than the top of the tailings pile. It is unclear whether this bench is an older portion of the tailings pile or whether tailings material had been deposited over the terrain with the passage of time, by wind and runoff. During periods of heavy precipitation runoff from the tailings pile flows onto this bench and then continues via an unnamed tributary stream to White Creek.

Coalinga Mine

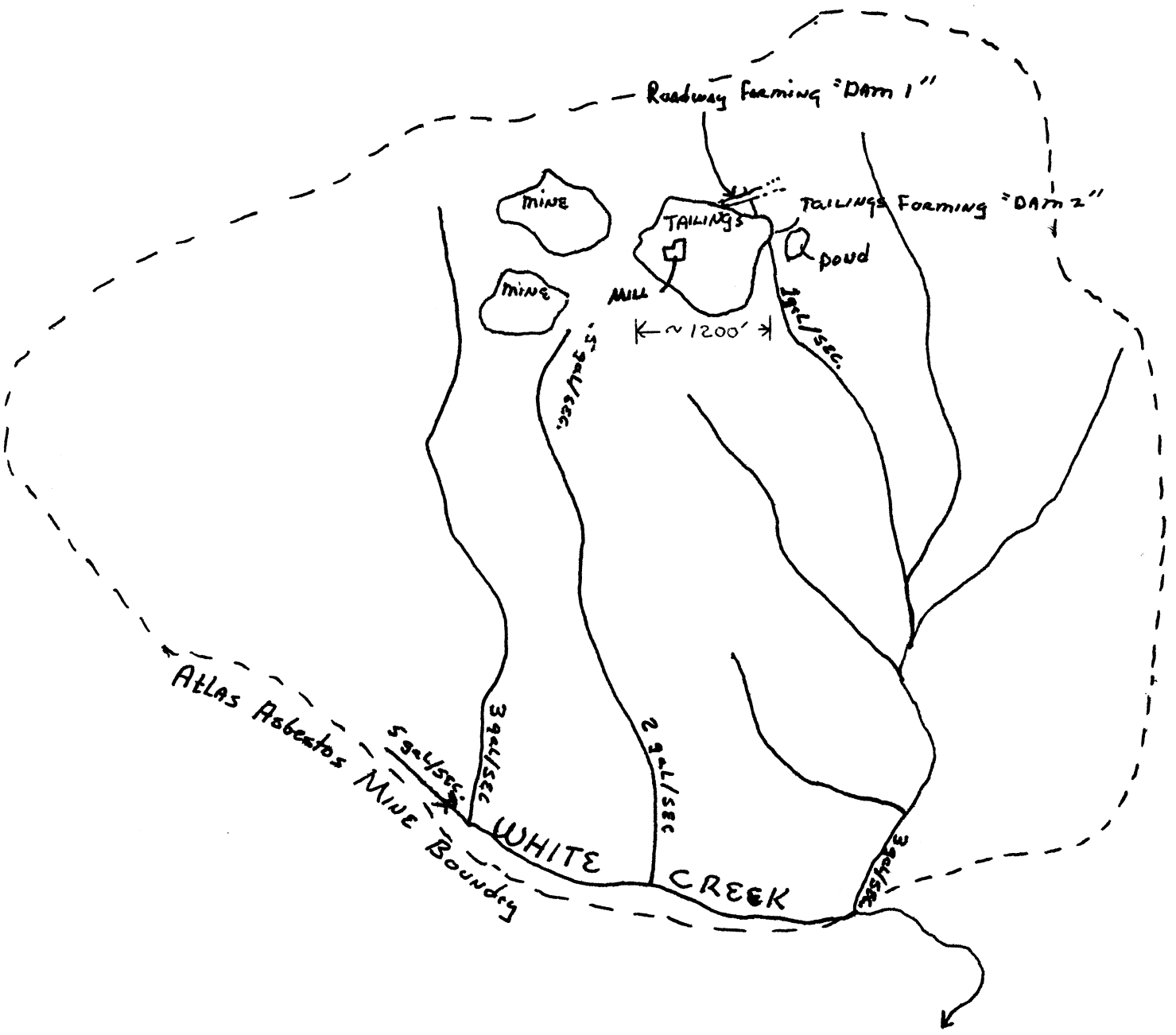
The Coalinga Mine is located approximately 17 miles northeast of Coalinga, California in the upper reaches of the watershed of Pine Canyon Creek. (See maps 5 and 7.) The mill and tailings lie at an elevation of 3200 feet. The surface mining area is approximately 1/2 mile from the mill site. Photographs C 1, C 2, C 3 combine to give a panoramic view of the mining area, the tailings pile and the mill site.



MAP 5

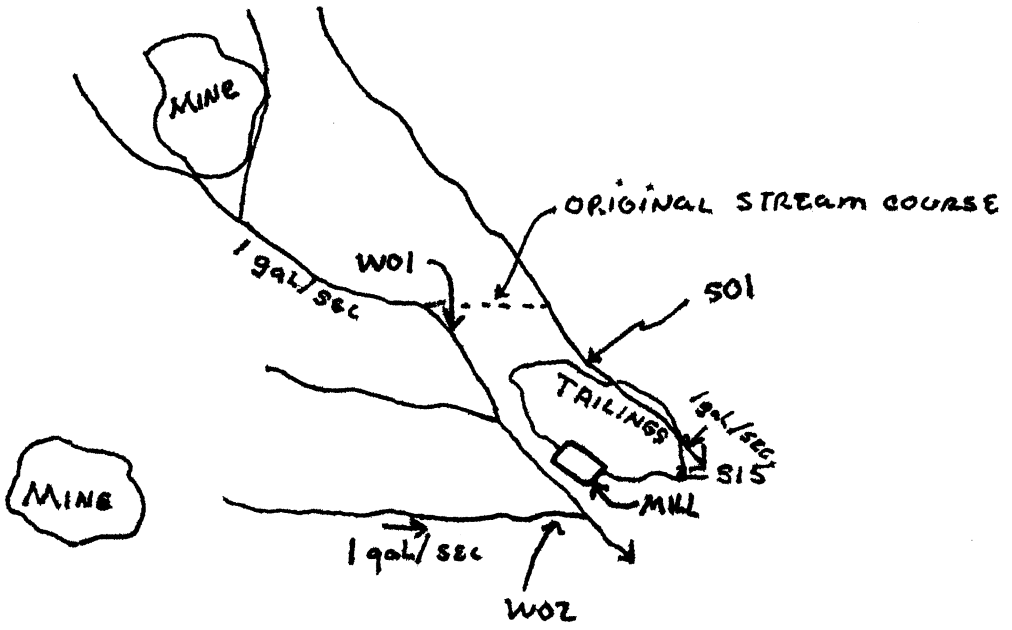
SAMPLING SITES— — —COALINGA MINE AREA

○ - WATER SAMPLING SITE
□ - SEDIMENT SAMPLING SITE
△ - WATER & SEDIMENT SAMPLING SITE



Field Sketch of the Atlas Asbestos Mine Area

MAP 6



Field Sketch of the Coalinga Mine Area

MAP 7

Much of the mining site is devoid of vegetation (See photos C 1 through C 7.) During periods of heavy precipitation and runoff this area is subject to extensive erosion as is indicated in the photos of the mining area. Runoff from the mining area reaches Los Gatos Creek via Pine Canyon Creek.

The tailings pile was estimated from field observations to be approximately 5 to 10 acres in area. Analysis of field samples (see Sampling section) indicated the tailings pile is 10% (by weight) chrysolite, a fiberous asbestos mineral. Photos C 8 through C 12 provide different views of the tailings pile. The tailings pile is located in a small canyon (see photo C 8.)

The location of the tailings pile in a natural drainage canyon can lead to extensive tailings erosion if erosion control structures are not utilized. Two major erosion control structures were observed. First, as indicated on map 7, an unnamed stream has been diverted from the tailings pile. The diverted stream completely bypasses the tailings. The second major erosion structure was a series of small dams located on the top and also downstream of the tailings pile (see photo C 10 and C 11.) Erosion of these dams has occured. The area surrounding the overflow pipes has been eroded to the point where each dam's capacity has been severely decreased. The furthest downstream dam observed was badly breached (see photo C 13). This series of dams, in their present condition has limited erosion prevention capability. Significant erosion of tailings material directly into an unnamed tributary of Pine Canyon Creek does occur.

Los Gatos Creek Water Utilization

The following utilizations of Los Gatos Creek and its tributaries were observed:

1. Drinking water for livestock

2. Irrigation.

Several times a year during periods of heavy runoff water from Los Gatos Creek enters the California Aqueduct. Untreated water is drawn from the aqueduct for irrigation purposes. Officials of the Department of Water Resources of the State of California indicate it is likely individuals or small groups drink this water. At this time a continuing effort is being made to identify any users of this water.

SAMPLING PROGRAM

Maps 3, 4, and 5 indicate the site where water and/or sediment samples were collected. The sampling sites were chosen with several goals in mind. First the amount of asbestos in the streams draining the mining areas was to be determined. Secondly the amount of asbestos in local streams not draining the area was to be determined. This would give some indication of the level of "background" asbestos in the streams of this area. Thirdly an attempt was to be made to determine if drainage from the mining area significantly increased the asbestos level in Los Gatos Creek, the major stream of this area. Water from Los Gatos Creek enters the California Aqueduct several times a year, during periods of heavy precipitation.

Water Samples Analysis

A scan of water sample W 14 utilizing transmission electron microscopy showed 7.5 (10^8) fibers/liter of chrysolite (asbestos). The fibers varied in length from .2 u to 7 u and had diameters of .04 u.

Sample W 14 was taken from Los Gatos Creek just downstream of the confluence of White Creek and Los Gatos Creek.

A water sample taken at approximately the same location as W 14 on April 17, 1980 contained 3.1 (10^{12}) fibers/liter of asbestos. Comparison of this concentration to the concentration of fibers detected in the sample taken on May 20, 1980 during this investigation indicates a higher concentration of asbestos in the stream during periods of greater precipitation and runoff.

Sediment Samples Analysis

Table 1 indicates the fiberous asbestos (chrysoltile) concentrations (by weight) in each sample. Appendix 1 contains GCA's report in its entirety.

Table 1

Sediment Sample	Asbestos (Chrysotile) Content (by weight)
S01	10%
S02	0
S03	10
S04	0
S05	10
S06	10
S07	15
S08	0
S09	<5
S10	0
S11	5
S12	15
S13	10
S14	<5
S15	15

Referring to Map 3 and Table 1, the following points should be noted:

1) Analysis of samples S03, S05, S06, S12 and S15 indicate the tailings piles and mine areas sampled are approximately 10 to 15% asbestos by weight.

2) Sample S13 was collected from a stream bed directly downstream from the Coalinga Mine tailings pile and was 10% asbestos by weight.

3) Sample S09 was taken from the bank of White Creek approximately 75 feet before the confluence of White Creek and Los Gatos Creek. It was <5% asbestos by weight. Sample S10 was taken from the bank of the Los Gatos Creek 45 feet before the confluence of Los Gatos Creek and White Creek and contained no asbestos.

CONCLUSIONS

The geomorphic features of this region clearly indicate it is subject to extensive erosion during times of heavy precipitation and runoff. The surface mining areas and tailings piles of both Atlas and Coalinga Mines are extensively eroded. The tailings piles are especially susceptible to erosion because of the finely ground, non-cohesive character of the tailings material. Analysis of soil samples indicated the tailings piles and mining areas are approximately 10% fiberous asbestos (chrysotile).

Due to a lack of an effective erosion control program the tailings piles are contaminating local streams with large amounts of fiberous asbestos. Drainage patterns indicate eroded material from the surface mining area and the tailing pile is carried to the tributaries of Los Gatos Creek. It is possible this asbestos laden eroded material is transported via Los Gatos Creek to the Coalinga area and as far as the California Aqueduct.

Analysis of water and sediment samples indicate that Los Gatos, White Creek, and White Creek tributaries are contaminated with asbestos.

There are indications this contamination increases significantly during periods of high precipitations and runoff. Specifically, these indications are:

1) Visible evidence of erosion of the surface mining areas and tailings piles. The visible drainage patterns clearly indicates eroded material from both mining areas and tailings piles is transported to local streams during periods of high precipitation and runoff.

2) Sediment samples of streams draining the mines contained up to 10% asbestos fiber by weight. This concentration decreased with distance from the mining sites.

3) Analysis of a water sample collected from Los Gatos Creek just below its confluence with White Creek on April 17, 1980 indicated $3.1(10^{12})$ fibers/liter of asbestos (chrysolite) were present. Analysis of a sample taken at the same approximate location on May indicated a concentration of asbestos (chrysolite.)

RECOMMENDATIONS

An erosion control program should be implemented to reduce erosion of the tailings piles and thus reducing the amount of asbestos entering local streams.

APPENDIX

GCA

Subject: Bulk Asbestos Analysis, Contract Number 68-01-4143, TSA 3, TO #82, (GCA 1-451-382)

Gentlemen:

The results of our analysis of the fifteen (15) samples submitted to us with your letter dated 6 June 1980 are as follows:

S01, (GCA A3077), Dry stream bed 75 yds. above Coalinga Asbestos Tailings
Asbestos (chrysotile) 10%, cellulose fiber 10%, clay/mica 15%, opaque phases 10%, antigorite (a variety of serpentine) 55%.

S02 (GCA A3078), West bank of San Luis Canal at Mile 158.36
No asbestos present, cellulose fiber and wood fiber 30%, carbonate (calcite) 25 to 30%, gypsum/anhydrite less than 1%, quartz less than 5%, opaque phases 10%, organic matter 25 to 30%.

S03, (GCA A3079), Atlas Asbestos tailings pile
Asbestos (chrysotile) 10%, glass fragments 10%, cellulose fiber trace, carbonate (calcite and dolomite) 5%, clays/micas 40%, quartz trace, opaque phases 10%, actinolite (an amphibole asbestos mineral) 25%.

S04, (GCA A3080), Below pond on east side of Atlas Asbestos tailings
No asbestos (except antigorite, see below) present, cellulose fiber less than 5%, carbonate (calcite and dolomite) 10%, clays/micas 15%, opaque phases 10%, antigorite (a serpentine group asbestos mineral, non-fibrous) 60%.

S05, (GCA A3081), South-east side of Atlas Asbestos tailings pile
Asbestos, (chrysotile) 10%, glass fiber trace, carbonate (calcite and dolomite) 5%, gypsum/anhydrite trace, talc and chlorite 25%, quartz less than 5%, opaque phases 20%, actinolite (an amphibole asbestos group mineral, non-fibrous) 35%.

S06, (GCA A3082), Atlas Asbestos tailings pile
Asbestos (chrysotile) 10%, glass fragments 5%, cellulose fiber trace, carbonate (calcite and dolomite) 5%, gypsum/anhydrite 5%, clays/micas 30%, quartz 5%, opaque phases 10%, actinolite (an amphibole group asbestos mineral, non-fibrous) 30%.

S07, (GCA A3083), Bank of White Creek
Asbestos (chrysotile) 15%, clays and micas 20%, opaque phases 5%, antigorite(a serpentine group asbestos mineral, non-fibrous) 60%.

S08, (GCA A3084), Tributary of Los Gatos Creek
No asbestos present, glass fragments less than 5%, cellulose fiber 1 to 5%, carbonate (calcite and dolomite) 40%, gypsum and anhydrite 15%, clays and micas 15%, quartz 20%, opaque phases less than 5%.

S09, (GCA A3085), Bank of White Creek
Asbestos (chrysotile) less than 5% cellulose (and wood) fiber 10%, carbonate (calcite and dolomite) 40%, gypsum and anhydrite 10%, opaque phases 5%, antigorite (a serpentine group variety of non-fibrous asbestos) 30%.

S10, (GCA A3086), Bank of Los Gatos Creek
No fibrous asbestos present, cellulose (wood) fiber less than 5%, carbonate (calcite and dolomite) 35%, clays and micas 35%, quartz 10%, opaque phases 5%, recrystallized glass (naturally occurring) 10%.

S11, (GCA A3087), Coalinga above Mill
Asbestos (chrysotile) 5%, glass fragments 10%, carbonate (calcite and dolomite) 5%, clays and micas 40%, opaque phases 10%, actinolite (an amphibole group, non-fibrous, asbestos mineral) 30%.

S12, (GCA A3088), Unnamed mine above Coalinga Asbestos Mill
Asbestos (chrysotile) 15%, cellulose (wood) fiber trace, carbonate (calcite and dolomite) 5%, gypsum and anhydrite less than 5%, clays and micas 35%, quartz 5%, opaque phases 10%, antigorite (a non-fibrous serpentine group asbestos mineral) 30%.

S13, (GCA A3089), Below Coalinga Asbestos Tailings
Asbestos (chrysotile) 10%, carbonate (calcite and dolomite) 20%, clays and micas 15%, opaque phases 15%, antigorite (a non-fibrous serpentine group asbestos mineral) 40%.

S14, (GCA A3090), Bank of stream below Coalinga Asbestos Tailings
Asbestos (chrysotile) less than 5%, cellulose (wood) fiber less than 1%, carbonate (calcite and dolomite) 15%, clays and micas 20%, organic debris 20%, opaque phases 10%, antigorite (a serpentine group mineral, non-fibrous) 30%.

S15, (GCA A3091), Coalinga Asbestos Tailings Pile
Asbestos (chrysotile) 15%, gypsum and anhydrite 5%, clays and micas 15%, opaque phases 5%, antigorite (a serpentine group mineral, non-fibrous) 60%.

The information provided for each sample regarding locality was provided by the U.S. EPA (Region IX). These determinations were made by polarized light microscopy at magnifications ranging from 20X to 400X. The estimated phase abundances are given in weight percent and are accurate to within 10 to 15 percent of the amount reported. The sensitivity for the detection of asbestos minerals is less than 1 percent by weight.

There are two morphologies of asbestos minerals present. Both fibrous and non-fibrous varieties of serpentine minerals as well as the amphibole mineral, actinolite, were seen. Both chrysotile and antigorite have the same chemical compostion ($Mg_3Si_2O_5(OH)_4$); however, the former occurs commonly as elongated fibers whereas the latter forms non-fibrous crystal aggregates. The difference in crystal habit is a reflection of the different crystallization history of each. Chrysotile develops by growth from a vapor (or gas) phase and antigorite develops through growth from a liquid phase. Depending upon the chemistry and physical properties of the gaseous or liquid phase, other minerals will also crystallize. These minerals would include actinolite ($Ca_2(Mg, Fe)_5Si_8O_{22}(OH)_2$)(a double chain silicate) and chlorite , ($(Mg, Al,Fe)_{12}Si_8O_{20}(OH)_{16}$) (a sheet silicate) plus quartz and a variety of other minerals which will vary in abundance from one deposit to the next, even within a particular geological environment. Note that the antigorite and actinolite varieties are generally considered non-fibrous and their health effect is not entirely known, but is likely of less concern than the fibrous varieties of these minerals. The clays and micas are of two possible origins. The clays are likely the result of physical and chemical weathering of the metamorphic rocks in the area. The micas may be primary, the result of weathering and transport of the sediment or they may also be secondary in origin, developing within the sediment.

We will retain these samples for a period of one (1) year unless you request their return at an earlier date. The "Chain of Custody Record" for each sample is being returned to you. If you have any questions regarding these analyses or on the significance of the results, please contact Dr. Charles Spooner directly.

Very truly yours,

Arthur Engelman
Manager
Contract Administration

AE:mw
Enclosures

PROLINE # 14911
KLEER-VU 8x10

No. A1, A2, A3, A4, A5, A6

Subject: Atlas Asbestos Mine Area

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1545

Direction: West

No. A7, A8, A9, A10

Subject: Tailings pile at the Atlas Asbestos Mine.

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1320

Direction: North

Photographer:
Kenneth Greenberg

Witness:
Richard Vaille

Date: 5/20/80

Time: 1300

Direction: NW

No. A11 Subject: Atlas Asbestos Tailings pile.

Facility: Atlas Asbestos Mine

Photographer:
Kenneth Greenberg

Witness:
Richard Vaille

Date: 5/20/80

Time: 12:15

Direction: West

No. A12 Subject: Atlas Asbestos Tailings pile-east side.

Facility: Atlas Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1410

Direction: South

No. A13 Subject: Atlas Asbestos Tailings pile. Site where sample SO6 was collected.

Facility: Atlas Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1405

Direction: South

No. A14 Subject: Atlas Asbestos Tailing pile.

Facility: Atlas Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 12:25

Direction: North

No. A15 Subject: Atlas Asbestos Tailings Pile. Sample SO3 was collected at this site. NOTE: The tailing in the background is blocking the stream channel.

Facility: Atlas Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 11:55

Direction: West

No. A16 Subject: Dam near tailing pile.

Facility: Atlas Asbestos Mine

No. A17, A18, A19, A20

Subject: East side of tailings pile

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 12:50

Direction: West

No. A21, A22

Subject: Atlas Asbestos Tailings Pile. This picture was taken from "Dam 4" looking south. Note the tailings material extending across the stream channel.

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 11:45

Direction: South

No. A23, A24, A25, A26, A27

Subject: This picture was taken from the south edge of the top of the tailings pile, facing south.

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1400

Direction: South

M000125

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1545

Direction: West

No. A28 Subject: Atlas Asbestos Mining Area. Note the drainage pattern

Facility: Atlas Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1545

Direction: NW

No. A29 Subject: Atlas Asbestos Mining Area.

Facility: Atlas Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 11:55

Direction: South

No. A30 Subject: Atlas Asbestos tailings. This picture was taken looking downstream from the lower dam on the east side of the tailings pile.

Facility: Atlas Asbestos Mine

Photographer:

Witness:

Date:

Time:

Direction:

No. Subject:

Facility:

No. C1, C2, C3

Subject: A panoramic view of the Coalinga mining area.

~~0000125~~

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 10:30

Photographer:
Kenneth Greenberg

Witness:
Richard Vaille

Date: 5/21/80

Time: 11:15

Direction: North

No. C4

Subject: The mining area north of the mill site at the Coalinga Mine.

No. C5, C6, C7

Subject: Mining area of the Coalinga Mine.

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 11:30

Direction: N-NW

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 1240

Direction: North

No. C8 Subject: A view of the face of the Coalinga tailings pile

Facility: Coalinga Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

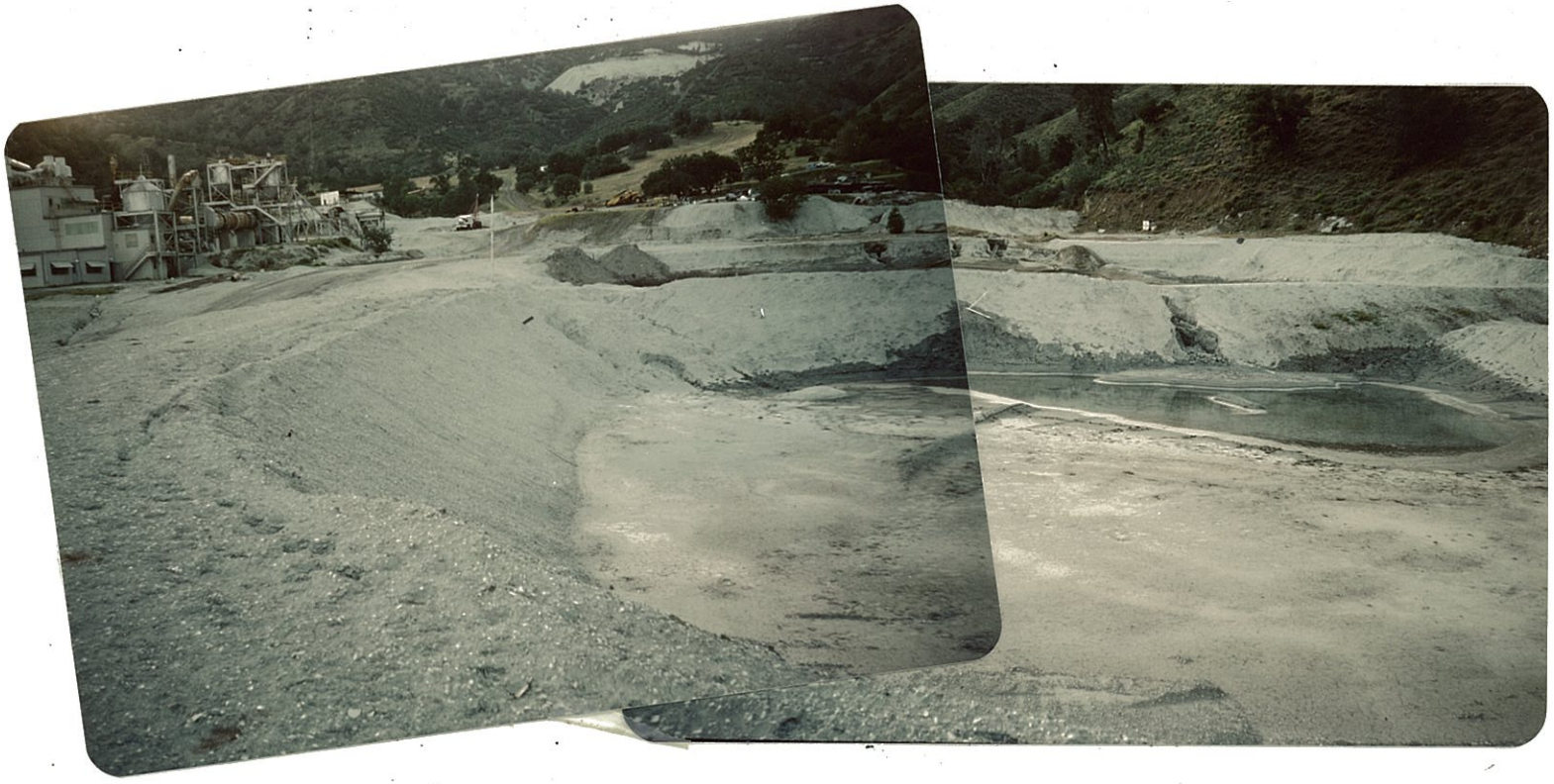
Date: 5/19/80

Time: 1900

Direction: North

No. C9 Subject: A view of the Coalinga tailings pile

Facility: Coalinga Mine



No. C10, C11

Subject: The top of the Coalinga tailings pile. Note the series of erosion control dams.

~~0000125~~

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1900

Direction: North

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1930

Direction: South

No. C12 Subject: Coaling Asbestos Tailings pile. This photo shows one of the Erosion Control dams.

Facility: Coalinga Mine

Photographer: Kenneth Greenberg

Witness: Rich Vaille

Date: 5/21/80

Time: 1250

Direction: North

No. C13 Subject: Collecting a sample from the bottom of the dam below the Coalinga Tailings pile. Note the erosion.

Facility: Coalinga Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1140

Direction: South

No. C14 Subject: Top of the tailings pile at Coalinga Asbestos Mine.

Facility: Coaling Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 11:15

Direction: West

No. C15 Subject: Sample site S11 - above the Coalinga Asbestos Mine. Note the naturally exposed soil.

Facility: Coalinga Asbestos Mine

No. C16, C17, C18

Subject: Coalinga Mine Mill. Note the barren area in the upper left corner. This is a mining area.

~~000125~~

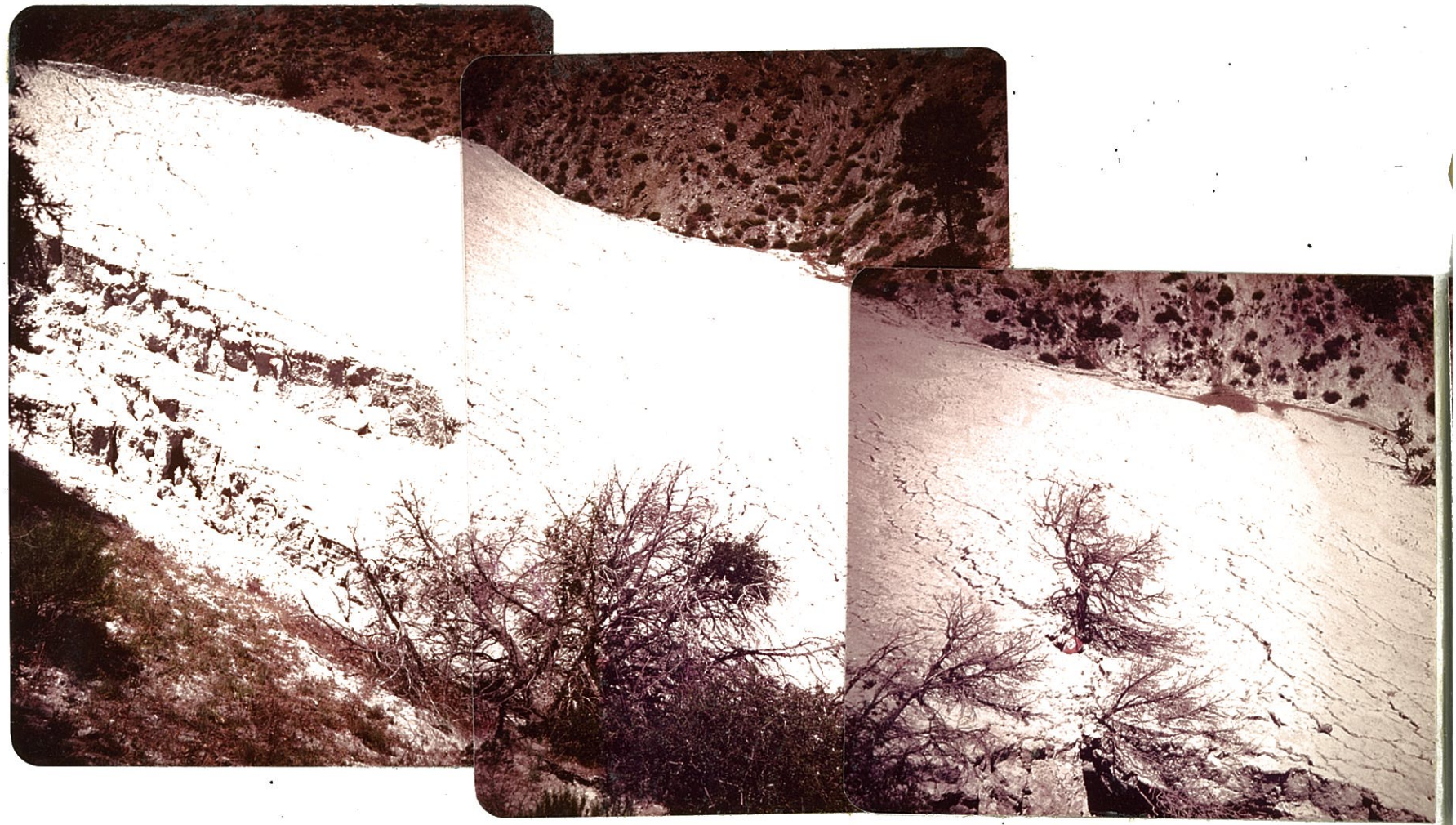
Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1700

Direction: Northwest



No. C19, C20, C21, C22

Subject: South Face of the Coalinga Mine

Tailings Pile

~~0000135~~

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 1340

Direction: East-Southeast

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1545

Direction: West

No. A28 Subject: Atlas Asbestos Mining Area. Note the drainage pattern

Facility: Atlas Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 1545

Direction: NW

No. A29 Subject: Atlas Asbestos Mining Area.

Facility: Atlas Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/20/80

Time: 11:55

Direction: South

No. A30 Subject: Atlas Asbestos tailings. This picture was taken looking downstream from the lower dam on the east side of the tailings pile.

Facility: Atlas Asbestos Mine

Photographer:

Witness:

Date:

Time:

Direction:

No. Subject:

Facility:

No. C1, C2, C3

Subject: A panoramic view of the Coalinga mining area.

~~0000125~~

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 10:30

Photographer:
Kenneth Greenberg

Witness:
Richard Vaille

Date: 5/21/80

Time: 11:15

Direction: North

No. C4

Subject: The mining area north of the mill site at the Coalinga Mine.

No. C5, C6, C7

Subject: Mining area of the Coalinga Mine.

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 11:30

Direction: N-NW

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 1240

Direction: North

No. C8 Subject: A view of the face of the Coalinga tailings pile

Facility: Coalinga Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1900

Direction: North

No. C9 Subject: A view of the Coalinga tailings pile

Facility: Coalinga Mine

No. C10, C11

Subject: The top of the Coalinga tailings pile. Note the series of erosion control dams.

~~0000125~~

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1900

Direction: North

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1930

Direction: South

No. C12 Subject: Coaling Asbestos Tailings pile. This photo shows one of the Erosion Control dams.

Facility: Coalinga Mine

Photographer: Kenneth Greenberg

Witness: Rich Vaille

Date: 5/21/80

Time: 1250

Direction: North

No. C13 Subject: Collecting a sample from the bottom of the dam below the Coalinga Tailings pile. Note the erosion.

Facility: Coalinga Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1140

Direction: South

No. C14 Subject: Top of the tailings pile at Coalinga Asbestos Mine.

Facility: Coaling Asbestos Mine

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 11:15

Direction: West

No. C15 Subject: Sample site S11 - above the Coalinga Asbestos Mine. Note the naturally exposed soil.

Facility: Coalinga Asbestos Mine

No. C16, C17, C18

Subject: Coalinga Mine Mill. Note the barren area in the upper left corner. This is a mining area.

~~000125~~

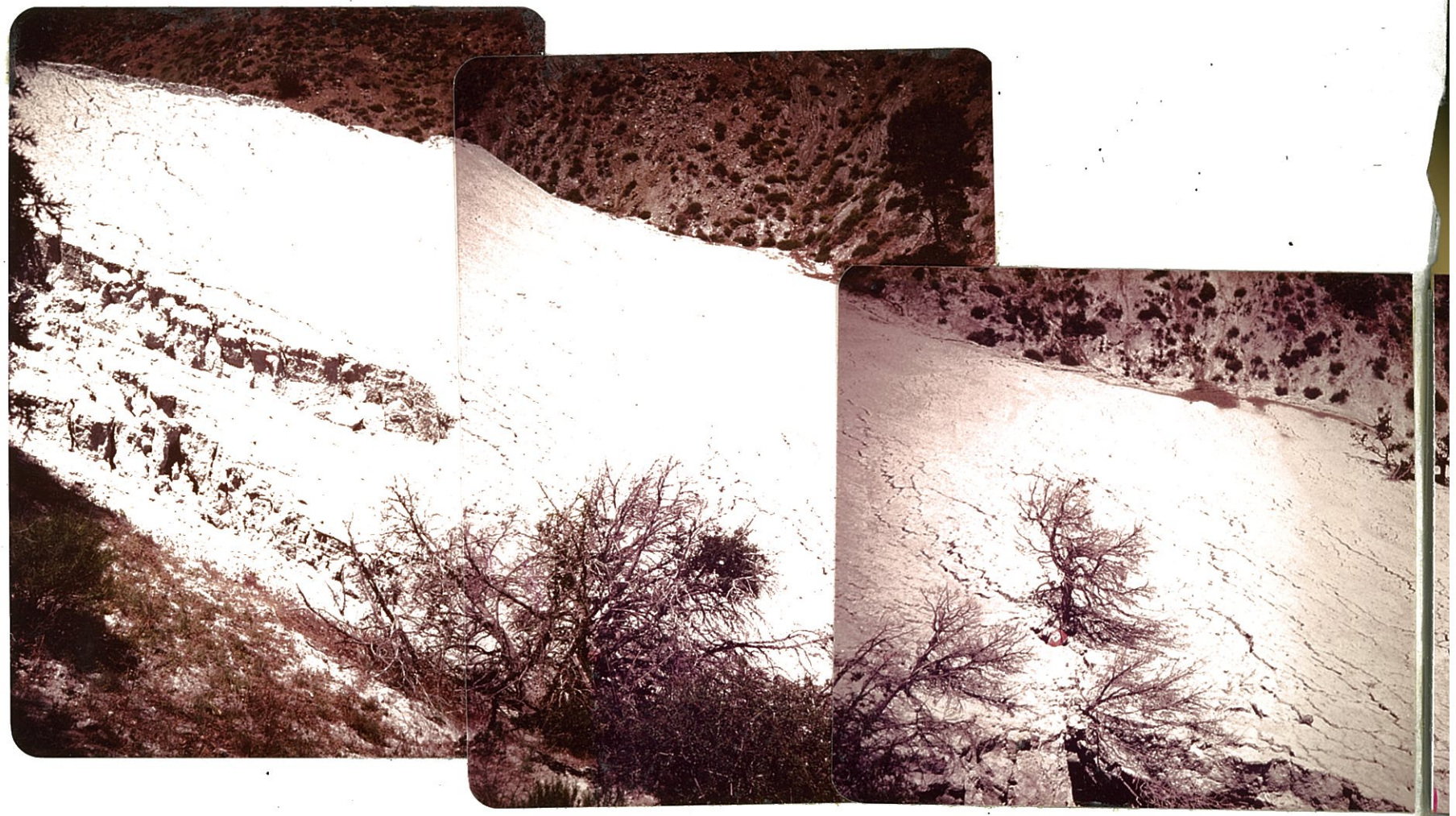
Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/19/80

Time: 1700

Direction: Northwest



No. C19, C20, C21, C22

Subject: South Face of the Coalinga Mine

Tailings Pile

~~0000135~~

Photographer: Kenneth Greenberg

Witness: Richard Vaille

Date: 5/21/80

Time: 1340

Direction: East-Southeast